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INCENTIVES AND DISINCENTIVES IMPACT ON MANAGERIAL COMMUNICATION - A SYSTEMIC-CYBERNETIC TREATMENT

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Abstract. The purpose of this article is to research the issue of managerial communication, being a part of a complex and larger research related to the impact of managerial communication on the development of small and medium-sized enterprises in the Republic of Moldova, having as the object of research the SMEs in the wine sector. One of the many concerns of a modern manager is improving managerial performance. In the daily challenge, they have to better achieve the proposed objectives, and the set tasks - to have better results, to form a stronger team and a more favourable organisational climate in the enterprise, to ensure better results, the manager can succeed even by improving internal managerial communication. Through internal managerial communication, the manager not only transmits and receives information from subordinates, but establishes constructive relationships with them and forms an organizational climate favourable to the growth and development of the company's performance. The organizational climate in the enterprise, as an inclusive result of the managerial communication style, can be defensive or cooperative, the specifics of these types of organizational climate being analysed in the respective article. The present article comes with a scientific novelty and more precisely a systemic-cybernetic perspective on the problem of subordinates' reaction to incentives and disincentives in managerial communication. At the same time, it is demonstrated the probability of balance of success in achieving tasks and objectives proposed to subordinates by the manager, to achieve the desired results depending on the use of incentives and disincentives in internal managerial communication.

Keywords: managerial communication, organizational climate, incentives, disincentives, performance.

Rezumat. Scopul prezentului articol este de a cerceta problematica comunicării manageriale și este parte dintr-o cercetare mai complexă și amplă ce ține de studierea impactului comunicării manageriale asupra dezvoltării întreprinderilor mici și mijlocii din Republica Moldova, având ca obiect de cercetare IMM-urile din sectorul viti-vinicol. Una dintre multitudinea de preocupări pe care o are un manager modern ține de îmbunătățirea performanțelor manageriale. În provocarea zilnică pe care acesta o are în a reuși mai bine

ralizarea obiectivelor propuse, a sarcinilor stabilite, în a forma o echipă mai consolidată și un climat organizațional mai favorabil în întreprindere, pentru a asigura rezultate mai bune, managerul poate reuși inclusiv prin îmbunătățirea comunicării manageriale interne. Prin intermediul comunicării manageriale interne, managerul nu doar transmite și primește informații de la subalterni, dar stabilește relații constructive cu aceștia și formează un climat organizațional favorabil creșterii și dezvoltării performanțelor întreprinderii. Climatul organizațional existent în întreprindere, urmare inclusiv al stilului de comunicare managerială poate fi unul defensiv sau de cooperare, în respectivul articol fiind analizat specificul acestor tipologii de climat organizațional. Prezentului articol vine cu o noutate științifică și mai exact o perspectivă sistemico-cibernetică a problemei reacției subalternilor la stimulente și antistimulente în comunicarea managerială. Totodată este demonstrată probabilitatea de echilibru a succesului realizării sarcinilor și obiectivelor propuse subalternilor de către manager, în scopul de a obține rezultatele dorite în dependență de utilizarea stimulentelor și antistimulentelor în comunicarea managerială internă.

Cuvinte-cheie: comunicare managerială, climat organizațional, stimulente în comunicare, antistimulente în comunicare, performanță.

1. Introduction

The importance of human resources in any sector of the national economy is indisputable. In recent times, the shortage of human resources in various sectors of the national economy has become a real challenge in their work. According to data from the National Bureau of Statistics, more than one and a half million active citizens are leaving Moldova. Worryingly, is the fact that in recent years economically active young people have been leaving in search of stability and better opportunities for their future [1]. In the wine sector in the Republic of Moldova, as in other sectors of our country's economy, there is a shortage of specialists in the field.

As an argument for this statement serves as an argument for the real situation in the sector and more specifically the fact that at least two wineries in our country (Asconi and the Vale Winery) have already hired people from Nepal to be trained in their activity. Several companies, facing a shortage of specialists, have turned to the consultancy services of Italian or French technologists in their winemaking activity to obtain quality and competitive products on international markets, as well as to communication and marketing specialists.

In these circumstances, the concern for human resources has become more topical than ever. How to increase employee satisfaction and motivate them to stay in the company, and how to motivate them to work for the company to achieve maximum efficiency have become current and important questions, both for the real sectors of the national economy and for the scientific environment in our country.

Within any enterprise there are two distinct universes. A first universe consisting of machines and technology, production flows, product competitiveness, productivity, the market. The second universe for an enterprise, as important and significant as the first universe, consists of the human resource. The technological universal on the one hand and the human universal on the other are two separates, but also complementary universes. The first universe, the technological one, is visible and rational, being able to be changed relatively faster and easier. The second universe of the enterprise, the human or cultural one, is a much more delicate one to manage, it mixes rationalities in different combinations, which only those who participate directly can understand [2, p.149].

In this context, the interest for the human resource, the management with this resource in a profitable manner for the enterprise, was and is a topical subject for the scientific world. How to increase employee satisfaction and motivate them to stay in the company, and how to motivate them to work for the company to achieve maximum efficiency have become current and important question for a modern manager.

The subject is also topical at the international level. A 2-year study of over 200 Google teams, in which over 250 attributes were analysed to understand what drives team performance, concluded that psychological safety is the most important component that makes certain teams successful compared to other teams and drives success [3].

In the article "Leadership that Delivers Results", published in the Harvard Business Review, Daniel Goleman talks about a leader's ability to create resonance - a reservoir of positivity that releases the best in people [4, p.7].

In the same order of ideas, according to some expert studies, there is even talk of the likelihood that we have entered a new era in which employees choose the company they work for and not the other way around [5, p.7].

In this context, we consider that ensuring a favourable organisational climate is one of the many solutions that should be taken into consideration to lead to employee satisfaction, successful performance of tasks and better organisational results. In turn, an organisational climate can also be created by the internal communication style present in the company. We are certain that a manager must demonstrate a willingness to adjust his or her behaviour, attitudes and skills to develop an environment of communication with employees that is conducive to business development and high business performance. Either how they know how to communicate with their subordinates, the company's communication policy, the communication strategies, and the communication behaviours of employees cumulatively generate a certain organisational climate. This organisational climate can have either a positive or a negative effect on the overall development of the company. This is why it is necessary for a manager to "keep a finger on the pulse" of the communication climate in the enterprise, to identify the negative aspects and to understand what the effects of these elements might be on the effectiveness of the enterprise. Then solutions must be found to change the negative elements in the communication process and transform them into constructive forms by improving communication.

The group means rules, reputation, goal, teamwork, etc. Meanings determined by interaction, so by communication. As long as there is good communication, there is also a maximum yield, but if this is missing, dissensions can be reached [6].

The role of communication in the activity of any enterprise is indisputable. A research conducted on several American companies in the process of transformation and that have implemented change management shows two interesting perspectives of the communication phenomenon in the company. On the one hand, the way they communicate in certain enterprises examined in the research represents an important problem, which slows down the proposed change. On the other hand, managerial communication was the factor that explained the successes recorded in change management in certain enterprises that were subjected to the same research. [7, p. 231].

Managerial communication is a fundamental process of mutual interaction based on feedback, in which managers at any level convey ideas, feelings, decisions to subordinates with the possibility of checking the manner of reception of the message by them. It influences and modifies perceptions, attitudes, behaviors, feelings, opinions of individuals and groups

and therefore constitutes a way through which people synergistically correlate their efforts. In the process of communication, both managers and subordinates "discover and converse, calm down and incite, contradict and agree, reject or accept both in the major and current issues of the organization" [8].

2. Defensive versus cooperative organisational climate

Specialized studies show that a modern manager is concerned with how he can improve his managerial performance, how he can succeed better in achieving the proposed objectives, get better results, form a more consolidated team and a more favorable organizational climate in enterprise.

In the daily challenge, he has to better achieve the proposed objectives, and the set tasks - to have better results, to form a stronger team and a more favourable organisational climate in the enterprise, to ensure better results, the manager can succeed even by improving internal managerial communication.

Research in recent years shows that there is an interdependence between organizational climate and team performance. Knowing this fact, the concern for creating an organizational climate becomes a current topic. A favorable organizational climate can be created including through managerial communication and the "tone" that the manager sets for his team.

First of all, it is important to clarify the notion of organizational climate. The organizational climate mediates, through a complex of connections, the development of group life and activity. Optimizing any determinant of climate will have a positive effect at the group level [9, p. 139].

The organizational climate consists, in essence, in the attitude of people towards their humanity, towards its objectives and the rules of behavior established by its management [10].

The organizational climate depends on the quality of the actions undertaken for ensuring physical and social environmental conditions without organizational and functional dysfunctions, respectively the way of setting up and the structure of work micro groups, the quality of work relations and the social atmosphere of work, the work appreciation system, the existing actions for improvement and promotion, by the information system [11, p. 134].

In another train of thought, the atmosphere inside organizations is importance to subordinates because people actually live in organizations, not just themselves think about the assigned tasks [12, p. 348].

Internal managerial communication with employees, can generate a defensive or a cooperative organizational climate, depending on its nature, on the psychological state it manages to generate in the collective of employees.

According to the literature reviewed, following the researches and analyzes, defensive and cooperative organizational climates represent two different types of workplace environments that can have a significant impact on employee behaviour and organizational performance.

A defensive organizational climate is characterized by competition, mistrust, and self-interest among employees. In such a climate, individuals tend to be guarded and protective of their own interests, often at the expense of collaboration and teamwork.

A cooperative climate tends to have several positive effects on organizational performance, including higher employee engagement, increased productivity, improved decision-making, and enhanced creativity and innovation. When employees feel supported,

trust their colleagues, and work together towards common goals, they are more likely to perform at their best and contribute to the overall success of the organization. In contrast, a defensive climate can have detrimental effects on employee morale, job satisfaction, and organizational outcomes. It can lead to higher turnover rates, reduced employee motivation, and limited information sharing, which can impede organizational learning and growth. Organizations should strive to create a cooperative climate by fostering a culture of trust, collaboration, and open communication. This can be achieved through effective leadership, clear goals and expectations, recognition of teamwork, and the establishment of supportive policies and practices.

According to the literature reviewed, we can state that in any enterprise there is a certain organisational climate, determined also by the existing communication climate, which is situated between two extreme limits, a defensive or a constructive climate, depending on the situation [13].

A defensive climate occurs when the manager uses a lot of criticism in communicating with employees, judging, and comparing employees to other employees, which is actually offensive to the employee's personality. As a rule, any offensive behaviour on the part of the manager generates defensive behaviour on the part of the subordinate, which manifests itself either by inhibiting him or her, by attacking, which gives rise to conflict or by avoidance and abandonment.

A **defensive climate** is determined by several activities of the manager such as:

- It shows in their work a permanent attitude of conter land evaluation;
- the employees' participation in the decision-making process is mimicked, the manager knows in advance what the decisions will be;
- doesn't present real interest in the views of subordinates;
- as a manager, shows superiority towards subordinates and makes employees feel inferior through gestures, messages and actions;
- shows an exaggerated self-confidence, which is more akin to arrogance;
- insists on always being right, even in conflict situations, without taking into account
 the different approaches that some subordinates may take; is rigid about his or her
 point of view.

At the opposite pole of the defensive climate is the cooperative climate. A cooperative climate in the company can be generated by constructive communication that creates positive emotions in the subordinate, an environment in which he or she feels valued and respected, and an environment in which the employee feels a sense of pride in being part of that company's team.

A **cooperative climate** is determined by several activities of the leader such as:

- in the process of communicating with his employees, the manager has a descriptive attitude, describing the problem and trying to identify solutions;
- in communicating with subordinates the manager gives them constructive feedback;
- appreciates the achievements of subordinates;
- the participatory process of employees in the decision-making process is not mimed, but genuine, and transparent, and the decisions taken by the manager are discussed with the employees;
- the manager shows real interest in the views of subordinates;
- as a leader in communicating with subordinates, shows spontaneity of expression, sincerity, and openness towards others;

- in the process of communication shows empathy, not judging the employee but trying to "fit the shoes" of the employee;
- respects the employee's value system in his/her work;
- shows respect for each individual, including through managerial communication;
- diminishes differences in status and power by adopting a position of equality with subordinates;
- shows flexibility, accepting the possibility that they may be wrong, and shows a willingness to change a certain behaviour or point of view.

In the context of interpersonal relationships or group dynamics, defensive and cooperative climates refer to the overall atmosphere or environment that influences communication, interaction, and behavior. Defensive climates are characterized by hostility, defensiveness, and a lack of trust, whereas cooperative climates are characterized by openness, respect, and collaboration. Here are some categories of behavioral characteristics associated with each climate. We have summarized the main categories of behavior characteristic of defensive and cooperative climates in Table 1.

 ${\it Table~1} \\ {\it Categories~of~behavior~characteristic~of~defensive~and~cooperative~Climates}$

Defensive ClimatesCooperative ClimatesEvaluationDescriptionControlProblem OrientationStrategySpontaneityNeutralityEmpathySuperiorityEquality

Certainty Provisionals

Source: Elaborated by the authors in the base of the source [14].

For small and medium-sized enterprises in the wine sector, managerial communication represents a real challenge (information provided by managers in this sector). A good proportion of managers in the sector are technically educated, passionate about wine production and have partial or incomplete information about managerial communication and its impact on business development. Following a direct interview with the president of the Association of Small Wine Producers of the Republic of Moldova and managers of several wineries, we concluded that managers in the sector prioritize communication with customers, considering the sale of products the key to the development of the business they run, but stating that communication with employees is also important (if an employee can understand you, forgive, then the customer does not forgive was one of the red threads we inferred). We concluded that managers are less aware of the value of human resources, and the impact that a cooperative or defensive organizational climate can have.

Being involved in the current activities of producing and managing the business, most of them have less time to research recent research on organisational climate, managerial communication, and conflict management. To all this can be added the fact that there is still a legacy from the socialist-communist totalitarian space in which there is a preconception that a manager must be authoritarian, otherwise, he risks having everyone climb on his head.

Based on this reasoning, a new, original concept in internal managerial communication is proposed, which can be implemented especially in small and medium-sized local companies, including those in the wine industry. The concept is based on incentives and

disincentives in the manager's communication with his employees. According to the explanatory dictionary of the Romanian language, stimulant means what stimulates, impulse, impetus, and urge. In the model we propose, the stimuli used in managerial communication generate positive emotions and the anti-stimuli generate negative emotions [15].

3. The problem of incentives and disincentives response: A systemic-cyber treatment (scientific novelty developed by the authors of the article)

Internal managerial communication has a special effect on the performance of tasks by subordinates, a fact that contributes to the achievement of the set objectives. Internal managerial communication takes on a special importance for small and medium-sized enterprises, because often, especially small enterprises, in order to optimize indirect costs, they combine some functions. Thus, the level of achievement of the set objectives depends on a correct internal communication. In order to determine the impact of internal managerial communication, on the development of small and medium-sized enterprises, it is proposed to determine the equilibrium probability of the success of the tasks and objectives proposed to subordinates by the manager at any hierarchical level of the enterprise. The equilibrium probability of the success of the tasks and objectives proposed to the subordinates by the manager can be determined according to the relationship indicated in the Eq. 1:

$$\hat{\mathbf{p}} = \frac{a}{a+b},\tag{1}$$

where:

- $\hat{\mathbf{p}}$ represents the equilibrium probability of success in achieving tasks and objectives proposed to subordinates by the manager to achieve certain results;
- *a* the multitude of incentives used by the company manager in communicating with company employees;
- *b* the multitude of disincentives used by the company's management in communicating with company employees.

By incentives (a) we mean methods used by the manager in communicating with his/her subordinates that generate positive emotions for the employee. Here we can list: positive appreciation of the subordinate's activities by the manager, giving constructive feedback, active listening in communication and showing genuine interest in the subordinate's points of view, descriptive attitude, which consists of describing the problem and avoiding criticism or attacking the person, spontaneity in expression, sincerity, openness, empathy or non-judgement of the employee in case of misconduct, judging the employee's behaviour and not his personality, respect in communication with subordinates, adopting an equal position in communication with subordinates, also as incentives including the increase of the salary of the employee; promoting the employee, offering bonuses, etc.

By disincentives (b) we mean methods of managerial communication used by the manager that generate negative emotions in the subordinate. The following actions can be listed as anti-stimulants: blaming, judgements, evaluation of personality and not of actions, labels, threats, reproaches, orders, guilt induction, comparisons, inappropriate tones, communication from a superior level, as well as financial actions such as salary reduction, demotion, etc.

So:

- a represent positive emotion generator;
- *b* represent negative emotion generator.

Expression $\hat{\mathbf{p}} = \frac{a}{a+b}$, being simplified by **a** obtain Eq. 2:

$$\hat{p} = \frac{\frac{a}{a}}{\frac{a}{a} + \frac{b}{a}} \tag{2}$$

The equilibrium probability of success in achieving tasks and objectives proposed to subordinates by the manager to achieve certain results will constitute the Eq.3:

$$\lim_{a \to \infty} \hat{\mathbf{p}}_{a \to \infty} = \frac{1}{1 - \frac{b}{a}} = \frac{1}{1 - 0} = 1$$
 (3)

According to the above relationship, the manager, using his subordinates, only incentives, the equilibrium probability of success in achieving tasks and objectives proposed to subordinates by the manager to achieve certain results will be 1.

Expression $\hat{\mathbf{p}} = \frac{a}{a+b}$, being simplified by b obtain the Eq. 4:

$$\lim \hat{\mathbf{p}}_{b\to\infty} = \frac{\frac{a}{b}}{\frac{a}{b} + \frac{b}{b}} = \frac{\lim_{b\to\infty} \frac{a}{b}}{\lim_{b\to\infty} \frac{a}{b} + \lim_{b\to\infty} \frac{b}{b\to\infty}} = 0$$
(4)

While, according to the above relationship, we see that the manager, using only activities in relation to his own employees, which cause only negative emotions, the equilibrium probability of success in achieving the tasks and objectives proposed to subordinates by the manager to achieve certain results will be 0.

To approve these conclusions, a survey was carried out on the managers of several small and medium-sized enterprises in the wine sector, who - according to their level of professional training (many of them having technical studies in winemaking and less managerial), according to their degree of personal development, according to the specific activities carried out, are different. Some managers, to achieve certain results for the company, mainly use managerial communication based on incentives. Other managers, in their work and their communication with employees, predominantly use disincentives-based communication.

A few clarifications are needed here. If the company's subordinates are motivated to work using communication methods that generate positive emotions, they are likely to give maximum performance when they are involved in the execution of the proposed tasks and the achievement of the set objectives, they do not leave the company, there is little chance of them going abroad, they work and contribute to the company's direct development. If the manager of the enterprise, in the process of communicating with employees, uses predominantly type b methods, which generate negative feelings in subordinates, then in these companies, part of the staff is prone to look for another job in another enterprise, to perform the proposed tasks at a minimum capacity of involvement or to leave abroad of the Republic of Moldova.

Let's exemplify this statement: let's admit 2 enterprises in the wine sector (small winemakers), enterprise A and enterprise B. Let's admit that the enterprise A are used by the manager uses incentives in communication with subordinates or type methods; at enterprise B, the manager uses mainly disincentives or type b methods.

We admit that the manager of enterprise A uses incentives in communication with his subordinates in a proportion of 90% and type methods and only 10% type b or disincentives methods.

In the relation proposed, this situation can be written for the enterprise A in the Eq. 5:

$$\hat{p}_A = \frac{0.9}{0.9 + 0.1} \to 1 \tag{5}$$

In the relation proposed, this situation can be written for the enterprise B in the Eq. 6:

$$\hat{p}_B = \frac{0.1}{0.1 + 0.9} \to 0.1 \tag{6}$$

According to the proposed model, the equilibrium probability of success in achieving tasks and objectives proposed by the manager to subordinates to achieve certain results in the case of enterprise A will be 1. While the equilibrium probability of success in achieving tasks and objectives proposed by the manager to subordinates to achieve certain results in the case of enterprise B will be 0.1.

Conclusions

Human resources are a resource without which the work of a business is unimaginable. Concern for human resources from a scientific point of view is topical at both enterprise and national economic levels. The process of communicating with subordinates has become a topical issue for the modern manager. who is aware of the effects that constructive or faulty communication can have. The process of managerial communication can also help to create a favourable organisational climate for the development of the enterprise. The organizational climate is defined in a very wide variety of definitions. this is due to the different point of view from which it is approached: pragmatic. affective. normative. structural. A defensive organisational climate can lead to poor business performance. while a cooperative organisational climate creates an environment that is conducive to development.

According to the formulas proposed by the authors from the systemic-cybernetic perspective. we see that the probability of success in achieving the tasks and objectives proposed by the manager to his subordinates. to obtain certain results. depends on the use of incentives or disincentives in managerial communication. The use of incentives in managerial communication with own subordinates leads to the equilibrium probability of success in achieving the tasks and objectives proposed to subordinates by the manager to obtain certain results will tend towards 1. The use of disincentives in managerial communication with own subordinates leads to the equilibrium probability of success in achieving the tasks and objectives proposed to subordinates by the manager to obtain certain results will tend towards 0.

Conflicts of Interest: The authors declare no conflict of interest.

References

- 1. The official website of the National Bureau of Statistics of the Republic of Moldova https://statistica.gov.md/ro. Available online: https://statbank.statistica.md/pxweb/pxweb/ro/20%20Populatia%20si%20procesele%20demografice_POPrec_POP070/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774 (accessed on 23.01.2023) [in Roumanian]
- 2. Sandu. M. L.; Pruteanu. L. M.; Tabacaru. A. M. The Relationship between Communication Style. Personality Factors and Management in Employees with Management Positions. *Anuarul Universității "Petre Andrei"* 2020. 25. pp. 166-178.
- 3. Wisdom. J.; Wei. H. Cultivating Great Teams: What Health Care Can Learn from Google. Available online: https://catalyst.nejm.org/doi/full/10.1056/CAT.17.0518 (accessed on 23.01.2023).
- 4. Goleman. D.; Mckee. A.;Boyatzis R. *Emotional Intelligence in Leadership*. Cartea Veche. Bucharest. Romania. 2007. 390 p.
- 5. Cişmariu. D. Internal communication in organizations. Tritonic. Bucharest. Romania. 2008. 160 p.
- 6. Seceleanu. A.. Rus. M. *Societate și comunicare; premise teoretice și metodologice.* Fundația "Andrei Şaguna". Constanta. Romania. 2005. 40 p.
- 7. Whetten. D.A.; Cameron. K.S. Developing manageent skillls. New York Harper Collins Publishers. 1991. 744 p.

- 8. Cândea. R.; Cândea. D. Comunicarea managerială aplicată. Expert. București. 1998. 370 p.
- 9. .Boqathy. Z. Manual de psihologia muncii și organizațională. Polirom. Iași. Romania. 2004. 320 p.
- 10. Mihu. A. Introducere in sociologie. Dacia. Cluj-Napoca. Romania. 1992. 74 p.
- 11. Pânișoară. I. Comunicarea eficientă. Polirom. Iasi. Romania. 2004. 430 p.
- 12. Avram. E., Cooper. C. *Psihologie organizațional-managerială. Tendințe actuale.* Polirom. Iasi. Romania. 2008. 930 p.
- 13. Climatul comunicării manageriale. Available online:http://stiintasiinginerie.ro/wp-content/uploads/2014/01/14-CLIMATUL-COMUNIC%C4%82RII-MANAGERIALE.pdf (accessed on 23.01.2023).
- 14. Communication. Culture. and Organizing. Available online: https://granite.pressbooks.pub/organizationalcommunication/chapter/chapter-7-culture-climate-and-organizational-communication/ (accessed on 23.01.2023) [in English].
- 15. Psychosocial Climate in the Primary Working Group in State Organizations. Available online: https://lumenpublishing.com/journals/index.php/upa-law/article/view/4087/2881 (accessed on 23.01.2023).

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